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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,594	09/16/2003	Edouard Serras	046190/269231	3956

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ALSTON & BIRD LLP  
BANK OF AMERICA PLAZA  
101 SOUTH TRYON STREET, SUITE 4000  
CHARLOTTE, NC 28280-4000

EXAMINER
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DIAMOND, ALAN D

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/663,594

Applicant(s)

SERRAS ET AL.

Examiner

Alan Diamond

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 8-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 09162003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I, claims 1-7 (and new claim 16) in the reply filed on July 6, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 8-14 and new claim 15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 6, 2004.

### ***Claim Objections***

3. Claim 6 is objected to because of the following informalities: In claim 6, at line 1, the word "claim" should be changed to "claimed". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1-7 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, at line 3, the term "made of a ceramic" should be deleted since line 6 of claim 1 sets forth that the dielectric substrate is made from a microporous ceramic. The same applies to dependent claims 2-7 and 16.

In claim 6, at line 3, the term "the substrate" should be changed to "a substrate" since it is not clear which of the plural substrates is being referred to.

Claim 7 is indefinite because "the substrates" (plural) lack positive antecedent support in claim 1. It is suggested that claim 7 be amended so as to depend from claim 6.

In claim 16, at line 2, the range "between 0.04 and 2 mm" can be interpreted to include the upper and lower limits of 0.04 and 2 mm, respectively. However, parent claim 3 requires less than 2 mm. In order to avoid confusion, it is suggested that the second line of claim 16 be rewritten as "have a thickness of less than 2 mm but greater than 0.04 mm."

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 7, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al (EP 801428 A1) in view of JP 2-21675 A (herein referred to as JP '675).

Amano et al teaches a thermoelectric generator comprising a plurality of n-type and p-type semiconductor elements (31-36) that are placed alternately on a dielectric ceramic substrate, such as a substrate made from alumina, zirconia, magnesia, forsterite, etc, and wherein the semiconductor elements (31-36) are connected in pairs

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at their ends to form a plurality of thermocouples (see page 3, lines 11-19; page 5, lines 14-34; and Figure 1). It is the Examiner's position that the alumina, zirconia, magnesia, forsterite, etc, inherently have a thermal conductivity of less than 0.5 W/mK, as per instant claim 2. The semiconductor elements can be made from a material such as silicide-based material, a Bi-Te-Sb-Se-based material, an Si-Ge-based material, or the exemplified  $\text{Fe}_{0.98}\text{Si}_{2.5}\text{Co}_{0.02}$  and  $\text{Fe}_{0.92}\text{Si}_{2.5}\text{Mn}_{0.08}$ , all of which render obvious the instant polycrystalline semiconductor ceramics (see page 3, lines 55-57; and page 5, lines 35-36). The semiconductor elements can have a thickness of 0.01 to 1.0 mm (see abstract; and claim 1 at page 9). The semiconductor ceramics are sintered on the substrate and are connected, for example, in series (see page 3, lines 50-52; and page 4, line 26). As seen in Figure 1, the substrate (1) can be in strip form. Amano et al teaches the limitations of the instant claims other than the difference which is discussed below.

Amano et al does not specifically teach that its ceramic substrate can be microporous. JP '675 teaches a ceramic substrate for a thermoelectric generator, wherein at least a part of said ceramic substrate is made from porous ceramic (see the entire JP '675 document). It is the Examiner's position that the porous ceramic part of the substrate prepared in JP '675's example is microporous, as here claimed. The use of such a substrate provides for a thermoelectric device having superior thermoelectric conversion efficiency and a high sensitivity (see the entire JP '675 document). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used JP '675's ceramic substrate for the ceramic substrate in Amano et al's

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thermoelectric generator because JP '675's ceramic substrate provides for a thermoelectric device having superior thermoelectric conversion efficiency and a high sensitivity.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,278,049 is hereby made of record.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond  
July 22, 2004

Alan Diamond  
Primary Examiner  
Art Unit 1753

